

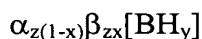
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-49 (cancelled)

Claim 50 (new): A method for generating hydrogen gas comprising decomposing a metal hydride in a mixture composed of the metal hydride, water, and a second solution which has a pH value lower than an aqueous solution of the metal hydride wherein the metal hydride has a formula:



where α and β are mutually different elements selected from Groups 1A, 2A, and 2B of the periodic table; and x, y, and z are defined respectively by $0 \leq x \leq 1$, $3 < y < 6$, and $0 < z < 3$.

Claim 51 (new): The method for generating hydrogen gas as defined in Claim 50, wherein α and β each represent an element selected from the group consisting of Li, Na, K, Mg, Ca, and Zn.

Claim 52 (new): The method for generating hydrogen gas as defined in Claim 50, wherein the aqueous solution of the metal hydride is incorporated with a second aqueous solution which has a lower pH value than said aqueous solution of said metal hydride.

Claim 53 (new): The method for generating hydrogen gas as defined in Claim 50, wherein the aqueous solution of the metal hydride and the second aqueous solution are mixed together for reaction continuously at a constant ratio.

Claim 54 (new): The method for generating hydrogen gas as defined in Claim 50, wherein the aqueous solution of the metal hydride has a pH value higher than 7 and the second aqueous solution has a pH value lower than 7.

Claim 55 (new): The method for generating hydrogen gas as defined in Claim 50, wherein the second solution is an acid in a liquid form or an aqueous solution of an acid.

Claim 56 (new): The method for generating hydrogen gas as defined in Claim 50, wherein the second solution is an acidic aqueous solution of an inorganic acid or an organic acid.

Claim 57 (new): An apparatus for producing hydrogen gas comprising: a first reservoir for storage of an aqueous solution of a metal hydride; a second reservoir for storage of a second solution which has a pH value lower than an aqueous solution of the metal hydride; and a reactor to mix together the aqueous solution of the metal hydride and the second solution, thereby generating hydrogen gas wherein the metal hydride has a formula: $\alpha_{z(1-x)}\beta_{zx}[\text{BH}_y]$ where α and β are mutually different elements selected from Groups 1A, 2A, and 2B of the periodic table; and x , y , and z are defined respectively by $0 \leq x \leq 1$, $3 < y < 6$, and $0 < z < 3$.

Claim 58 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein α and β each represent an element selected from the group consisting of Li, Na, K, Mg, Ca, and Zn.

Claim 59 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the aqueous solution of the metal hydride has a pH value higher than 7 and the second aqueous solution has a pH value lower than 7.

Claim 60 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the second solution is an acid in a liquid form or an aqueous solution of an acid.

Claim 61 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the second solution is an acidic aqueous solution of an inorganic acid or an organic acid.

Claim 62 (new) The apparatus for producing hydrogen gas as defined in Claim 57, wherein the first reservoir and the second reservoir each is connected to the reactor.

Claim 63 (new): The apparatus for producing hydrogen gas as defined in Claim 57, which has a mechanism by which the aqueous solution of the metal hydride and the second aqueous solution are mixed together for reaction continuously at a constant ratio.

Claim 64 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the first reservoir and the second reservoir are constructed such that they are completely filled at all times with the aqueous solution of the metal hydride and the second solution.

Claim 65 (new): The apparatus for producing hydrogen gas as defined in Claim 64, wherein the first reservoir has an aqueous solution container which is made of an alkali-resistant flexible material and the second reservoir has a liquid container made of an acid-resistant flexible material.

Claim 66 (new): The apparatus for producing hydrogen gas as defined in Claim 65, wherein the internal container as the aqueous solution container of the first reservoir is installed in an alkali-resistant external container, and the internal container as the liquid container is installed in an acid-resistant external container.

Claim 67 (new): The apparatus for producing hydrogen gas as defined in Claim 66, wherein the space between the internal container of the first reservoir and the external container is filled with a substance which cures upon reaction with the alkaline aqueous solution, and the space between the internal container of the second reservoir and the external container is filled with a substance which cures upon reaction with the acidic aqueous solution.

Claim 68 (new): The apparatus for producing hydrogen gas as defined in Claim 57, which has a flow regulator placed between the reactor and at least one of the first reservoir and the second reservoir.

Claim 69 (new): The apparatus for producing hydrogen gas as defined in Claim 68, which has a pressure sensor to detect an internal pressure of the reactor and a controller to regulate the action of the regulator in response to a value detected by the pressure sensor.

Claim 70 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the hydrogen gas is discharged from the reactor.

Claim 71 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the first reservoir and the second reservoir each has a safety valve to maintain the internal pressure below a prescribed value.

Claim 72 (new): The apparatus for producing hydrogen gas as defined in Claim 71, wherein the safety valve for the first reservoir and the safety valve for the second reservoir are installed such that the gas pressure is applied in a mutually opposite direction.

Claim 73 (new): The apparatus for producing hydrogen gas as defined in Claim 57, which has a waste liquid reservoir to store waste liquid discharged from the reactor.

Claim 74 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the waste liquid that has occurred in the reactor is introduced into and stored in the space between the external container and the internal container of the first reservoir and/or the second reservoir.

Claim 75 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the first reservoir and the second reservoir include any one of concentric dual-pipe and multi-pipe structure connected to the reactor.

Claim 76 (new): The apparatus for producing hydrogen gas as defined in Claim 75, wherein the pipe structure to store the waste liquid from the reactor includes any one concentric dual-pipe and multi-pipe structure.

Claim 77 (new): The apparatus for producing hydrogen gas as defined in Claim 75, wherein the space between the first reservoir and the second reservoir is filled with a substance which cures upon reaction with the alkaline aqueous solution and/or the acidic aqueous solution.

Claim 78 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the reactor is provided with a mechanism to separate hydrogen gas.

Claim 79 (new): The apparatus for producing hydrogen gas as defined in Claim 78, wherein the reactor is connected to a porous pipe which is permeable to hydrogen gas and impermeable to liquid, the reaction to evolve hydrogen gas takes place in the reactor and/or the porous pipe, and the mixture of the evolved hydrogen gas and the aqueous solution passes through the porous pipe so that only hydrogen gas permeates through the porous pipe and the hydrogen gas is separated from the aqueous solution.

Claim 80 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the reactor is composed of a liquid introducing part and a water-absorbent part connected thereto, and the aqueous solution of the metal hydride and the second solution are introduced into the liquid introducing part for reaction, and the aqueous solution is absorbed by the water-absorbent part.

Claim 81 (new): The apparatus for producing hydrogen gas as defined in Claim 80, wherein the liquid introducing part and the water-absorbent part are adjacent to each other.

Claim 82 (new): The apparatus for producing hydrogen gas as defined in Claim 80, wherein the water-absorbent part has a space formed therein, and the aqueous solution of the metal hydride and the second solution are supplied to the space through the water-absorbent part.

Claim 83 (new): The apparatus for producing hydrogen gas as defined in Claim 57, which has a control mechanism to regulate the flow rate of the aqueous solution of the metal hydride and the second solution which are supplied to the reactor.

Claim 84 (new): The apparatus for producing hydrogen gas as defined in Claim 83, wherein the pipe to supply the aqueous solution of the metal hydride to the reactor and the pipe to supply the second solution to the reactor differ in diameter from each other.

Claim 85 (new): The apparatus for producing hydrogen gas as defined in Claim 83, wherein the control mechanism has a pressure-displacement conversion element.

Claim 86 (new): The apparatus for producing hydrogen gas as defined in Claim 85, wherein the control mechanism is a pressure-displacement conversion element of diaphragm type.

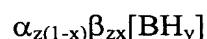
Claim 87 (new): The apparatus for producing hydrogen gas as defined in Claim 57, wherein the containers for the aqueous solution of the metal hydride and the second solution each has a movable wall in contact with the inside thereof to push out any one of the aqueous solution or the second solution.

Claim 88 (new): The apparatus for producing hydrogen gas as defined in Claim 87, wherein the movable wall is energized in one direction by an elastic means attached to one side thereof so that any one of the aqueous solution or the second solution is continuously pushed out.

Claim 89 (new): The apparatus for producing hydrogen gas as defined in Claim 87, wherein the movable wall constitutes a piston of a syringe.

Claim 90 (new): The apparatus for producing hydrogen gas as defined in Claim 89, wherein the waste liquid discharged from the reactor is stored in the space which accommodates the elastic means.

Claim 91 (new): An energy conversion system comprising a hydrogen gas generating apparatus and an energy converting apparatus to convert the hydrogen gas produced by said hydrogen gas generating apparatus into electrochemical energy, said hydrogen gas generating apparatus having a first reservoir for storage of an aqueous solution of a metal hydride, a second reservoir for storage of a second solution which has a pH value lower than that of the aqueous solution of said metal hydride, and a reactor to mix together the aqueous solution of said metal hydride and said second solution, thereby generating hydrogen gas wherein the metal hydride has a formula:



where α and β are mutually different elements selected from Groups 1A, 2A, and 2B of the periodic table; and x, y, and z are defined respectively by $0 \leq x \leq 1$, $3 < y < 6$, and $0 < z < 3$.

Claim 92 (new): The energy conversion system as defined in Claim 91, wherein α and β each represent an element selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, and zinc.

Claim 93 (new): The energy conversion system as defined in Claim 91, which has a mechanism to supply heat evolved by the reactor to the energy conversion apparatus.

Claim 94(new): The energy conversion system as defined in Claim 91, which has a mechanism to supply water evolved by the energy conversion apparatus to the hydrogen gas generating apparatus.

Claim 95 (new): The energy conversion system as defined in Claim 91, wherein the energy conversion apparatus is united with the reactor.

Claim 96 (new): The energy conversion system as defined in Claim 91, wherein the energy conversion apparatus is a fuel cell.

Claim 97 (new): The energy conversion system as defined in Claim 91, wherein an electrochemical energy conversion means composed of a hydrogen electrode, an ion conductor, and an oxygen electrode is connected to the reactor.

Claim 98 (new): The energy conversion system as defined in Claim 97, wherein the reactor is held between a pair of the electrochemical energy conversion means.